I recently acquired a lot of Apple II Plus computers, and, much to my great surprise, in among that lot was an original Apple ][ unit (Figures 1 & 2)... or so I thought! With the help of some online folks and extensive internet searching, I found that this unit is actually one of the first Apple ][ PLUS units made. The unit turns ON and does boot, but there is currently a problem with the video – black background with vertical, wide white bars – that I need to figure out how to correct. But before any of that, I set out to pull the system apart and clean everything. During that process, I observed several differences between this early ][+ and later Ile.

Figure 1. The Apple ][ nameplate on the top cover.

Figure 2. The Apple ][+, Serial Number 03884.
After giving the system case a thorough disinfecting wipe down, I turned the unit over and received my second surprise of the day (Figure 3): the serial number of 03884! Note the serial number preface of A2S2, signifying an Apple ][+; a preface of A2S1 would signify an Apple ][.

Figure 3. The Apple ][+ Serial Number tag on the bottom of the base.

The base pan is in excellent condition with the only major mar being what appears to be a social security number etched in (Figure 4).

Figure 4. The Apple ][+ base pan showing the serial number label & etching.
There are 10 screws holding the base pan to the case (shown in green in Figure 5), situated furthest out to the edge. In addition, there are 4 smaller screws (purple in Figure 5) which affix the power supply unit to the base pan. Then there are 6 other screws. One (shown in blue in Figure 5) is for a bolt that actually runs through the center of the motherboard; the other 5, non-labelled, are for nylon risers that position and hold the motherboard in place.

Unlike the later models of the Apple II to follow, which used round-headed screws to affix the base pan to the cover, the Apple ][+ used flat-headed screws which were recessed into the pan (Figure 6).
The next difference I observed was in the case itself. The left and right back corners are molded differently from the case of the Apple ][ Plus and later models (Figure 7). The portion which juts out – “lid rest” - is where the cover sits and is “locked” by the black plastic Velcro-like fasteners. In addition, not visible in Figure 7, there is space between the lid rest and the main body of the case, as the lid rest sits lower than the body.

Figure 7. View of the case’s left rear corner from below, showing the molded lid rest.
There is also a date stamp on the underside of the case indicating a manufacture date (?) of “Jan 23 1979” (Figure 8). Figure 9 shows the location of that date stamp on the case.

Figure 8. Data stamp on case.

Figure 9. Keyboard affixed to case. Note date stamp is just above the upper right corner of the keyboard in this view.
The keyboard was held in place by 4 screws, one in each corner. When I removed those screws and lifted out the keyboard, I noticed that those screws were not directly screwed into the case itself, as in later Apple IIs, but rather there are metal mounting bars, one on either side, which are affixed to the case with 2 screws each (Figure 10). Each of these mounts have two risers which accept the screws that affix the keyboard to the case (Figures 11 & 12).

Figure 10. Keyboard mounts affixed to the case.
Figure 11. Locations of mounting studs on the keyboard mounting brackets.

Figure 12. Closeup of the keyboard mount.
Figure 13 shows the keyboard from beneath. The ][+ keyboard is far different from those of later Apple IIs. One of the most notable differences is that each key switch is screwed to the circuit board (Figure 14). Both pins are also soldered to the board. In the later keyboards of the ][+ and Ile, the key switches are held in place only by the two solder joints and no screw.

![Figure 13. The Apple ][+ keyboard underside.](image1)

![Figure 14. Close-up view of the Apple ][+ keyboard underside showing the screws which hold each key switch to the circuit board.](image2)
What I found a bit odd is that the key switch screw is not centered but rather is off-center quite a bit. Figure 15 shows a close-up view with the 2 soldered pins and single screw for one key encircled. In Figure 15, the annotated key switch is #1. You can easily see that for other key switches, the screw lies between two adjacent switches, so when replacing a key switch, you need to ensure that you have removed the correct screw for the switch to be replaced.

![Figure 15. Close-up view illustrating the key switch pins (2) and fastening screw for key #1.](image)

Turning the keyboard over (Figure 16), it doesn’t look far different from the keyboard of the Apple IIe. Sure, the bright red flat cable that connects the keyboard to the motherboard stands out! Note that the top and bottom edges have a metal support bracket running the width of the keyboard. This bracket is U-shaped in cross-section.
The next difference was observed when the key caps were removed for cleaning (Figure 17). The key caps themselves look identical to those of later Apple IIs that I have in my collection: brown keys, white lettering, and white plastic on their underside. It is the key switches, again, which are significantly different (Figure 18). Figures 19 & 20 show close-up views of the left & right sides, respectively.
Figure 19. Close-up view of the left side of the Apple ][+ keyboard.

Figure 20. Close-up view of the right side of the Apple ][+ keyboard.
The tops of the key switches have the + stem which inserts into the female + groove inside the key cap. What is obviously different is that there is a white plastic base plate below the stem, square and rotated 45° to the stem, giving a diamond appearance (Figure 21).

![Figure 21. Close-up view of the Apple ][+ key switch.](image)

There are also some noteworthy differences in the base pan assembly (figure 22). Notice that the speaker is embedded into a foam (Figure 23). Both the foam and the speaker are glued to the base pan, so replacing a speaker entails removing the foam and chipping away the glue holding the base of the speaker to the base pan. The other significant difference is that the speaker is facing UP rather than down in later ][+ and IIe systems. Also in later ][+ and IIe systems, the speaker was reoriented to face down upon a grill in the base pan so that the speaker could more easily be heard.
Figure 22. The Apple ][+ base pan assembly showing the power supply, motherboard & speaker.

Figure 23. Close-up view of the speaker & foam.
Another difference is that there is a nut & bolt which protrudes through the base pan and motherboard (Figure 24). This bolt is just forward of the ROM EO (location F8 on the motherboard).

Finally, there are a few markings on the motherboard itself worth noting. In the forward right corner of the motherboard, the board is marked “62 F.P.” in magic marker (Figure 25). I have absolutely no idea what this references. (If you know for sure what this means, please let me know!)

Figure 24. Location of the bolt through base pan and motherboard.

Figure 25. Forward right corner of motherboard showing markings.
In the rear left corner is what appears to be “793i” but I believe this is actual “7931”, the date stamp for when the motherboard was manufactured (1979, 31st week).

Figure 26. Rear left corner of motherboard showing manufacture date (1979, 31st week).

When re-assembling the system, I noticed something I hadn’t noticed before. Along the back, there are three nylon risers which are screwed into the base pan from the underside, as was noted earlier. The middle of these nylon risers actually had a metal tab through which the riser passes before passing through the motherboard (Figure 27). This tab is 0.75” wide and L shaped, pointing up from the motherboard/base pan. This tab fits into a slot in the base of the case (Figure 28). The only purpose of this tab-&-slot arrangement that I can see is to help keep the back of the case from being pulled backwards when users are connecting/disconnecting peripherals which may be affixed to the back of the case.
Figure 27. Location of the tab sandwiched between the motherboard and base pan in the center of the motherboard.

Figure 28. View of bottom looking up, showing the tab inserted into the case slot.
There you have it – my Apple ][+ #3884. As I indicated earlier, the system is having some problem with the video. I have removed every chip and reinserted to ensure proper contact. Many of the chips had tarnished pins, which were cleaned with emery material. I have swapped all chips associated with video on the board, but to no avail: I still have a static black screen with wide white vertical bars. If you have any suggestions as to which elements may be blown, I would love to hear from you!